DEC STD 100-0 POLICY AND REQUIREMENTS FOR THE PRODUCT CHANGE PROCESS

DOCUMENT IDENTIFIER: A-DS-EL00100-00-0 Rev H, 18-Jan-1989

ABSTRACT: This standard provides information about the ownership of DEC STD 100-0, its Advisory Board Committee Charter, and the Product Change Process policies and terminologies for changing products within Digital.

APPLICABILITY: This standard provides general information for directions on processing Change Orders to any of Digital's products. It applies to all Digital activities that are responsible for initiating, evaluating, approving, and implementing changes to any product.

STATUS: APPROVED 18-Jan-1989; see EL-INDEX-00 for expiration date.

This document and the figures contained herein are confidential and proprietary. They are the property of Digital Equipment Corporation and shall not be reproduced or copied or used in whole or in part as the basis for the manufacture or sale of items without written permission. This is an unpublished work protected under the Federal copyright laws.

© Digital Equipment Corporation. 1989. All rights reserved.

DEC STD 100-0 POLICY AND REQUIREMENTS FOR THE PRODUCT CHANGE PROCESS

DOCUMENT IDENTIFIER: A-DS-EL00100-00-0 Rev H, 18-Jan-1989

REVISION HISTORY:	Rev A,	05-Aug-1974	
	Rev B,	24-Feb-1975	ECO Number ML001
	Rev C,	25-Sep-1975	ECO Number ML002
	Rev D,	16-Jun-1977	ECO Number ML003
	Rev E,	12-Jan-1978	ECO Number ML004
	Rev F,	07-Apr-1983	ECO Number ML005
	Rev H,	18-Jan-1989	ECO Number CT006
Document Management Category:	TTE		
Responsible Department:	Product Change Process Office		
Responsible Person:	Carlton Davenport		
Authors:	Ed LoTurco, J. Bailey		

APPROVAL: This document has been reviewed and recommended for approval by the General Review Group for its category.

Carlton Davenport, PCPO Manager

Eric Williams, Standards Process Manager

Direct requests for further information to:

Ed LoTurco
PKO3-1/D16, DTN: 223-4750, GOTURK::LOTURCO

Copies of this document can be ordered from:

Standards and Methods Control
NRO4/D4, DTN: 234-4423, JOKUR::SMC

Please provide your name, mail stop, cost center, badge number, and node address when ordering.

CONTENTS

1 INTRODUCTION 1
1.1 PURPOSE 1
1.2 SCOPE 2
1.3 RESPONSIBILITIES 2
1.3.1 Product Change Process Office (PCPO) 2
1.3.2 Product Change Team 2
1.3.2.1 Design/Support Engineering 2
1.3.2.2 Manufacturing 3
1.3.2.3 Customer Services 3
1.3.3 Product Safety/Regulatory Engineering 4

2 GENERAL REQUIREMENTS 4
2.1 ASPECTS OF PRODUCT CHANGE 4
2.1.1 Identification of Need 4
2.1.2 Technical Investigation 4
2.1.3 Impact Analysis 5
2.1.4 Product/Documentation Update 5
2.1.4.1 Documentation 5
2.1.4.2 Product 5
2.2 PROCESSING METHODS 5
2.3 EXCEPTION MANAGEMENT OF URGENT PRODUCT CHANGES 5

3 WHERE TO GET ASSISTANCE 6

GLOSSARY 7

Appendix A REFERENCED AND RELATED DOCUMENTS 11

A.1 EL-Class Digital Documents 11

1 INTRODUCTION

This section of DEC STD 100 provides the basic philosophy, policy, and definitions associated with the Product Change Process. In time, the other sections will cover specific details related to hardware, firmware, software, documentation, purchase specifications, and finance. As these sections are created or revised, this section will be modified to reflect those enhancements. There will also be a procedures manual created to provide end users with more details of Product Change responsibilities and requirements.

The current standards and procedures are consolidated in *DEC STD 100 ECO Process and Procedures,* a manual that contains the following documents:

- *DEC STD 100-0 Policy and Requirements for the Product Change Process*(this document)
- *DEC STD 100-1 Engineering Change Orders - Hardware*
- *DEC STD 100-1C Engineering Change Orders - Financing ECOs to Hardware*
- *DEC STD 100-2 Purchase Specification ECOs*
- *DEC STD 100-3 Diagnostic Engineering Change Orders (DECOs) and Patch Orders (DEPOs) and Form Preparation*
- EL-EN100-1A, *Engineering ECO Coordination Procedure*
- EL-EN100-1B, *Hardware ECO Form Procedure*
- EL-EN100-1D, *Preliminary Change Authorization (PCA) Process*

Many Digital facilities have documented site-specific ECO review and implementation procedures that are supplementary to the above documents. Such documents are controlled by the originating plants as defined by *DEC STD 115-0 Manufacturing Plant Documentation (MPD) Identification and Control*.

1.1 PURPOSE

The Product Change Process occurs when a change to a product and/or its documentation is initiated, approved, and implemented; it requires the interaction and cooperation of many groups.

This section of the Standard serves three basic purposes:

a. Define the Corporate Product Change policies to be followed when processing any product change.

b. Provide a new glossary of terms and definitions to reduce any chance of misinterpretation of terms across groups.

c. Describe the Product Change responsibilities of the Product Change Team.

The Product Change Process is managed by the Product Change Process Office (PCPO). This office is responsible for establishing, distributing, and managing all policies related to this process.

1.2 SCOPE

This standard describes the basic rules and requirements of the Product Change Process, and stresses the importance of accurately assessing the impact of product change. This assessment can only be conducted by the assigned "Product Change Team", consisting of representatives from the design engineering, manufacturing, and customer service organizations. The Product Change Team can evaluate all facets of product change much more effectively and efficiently as a team than they could as individuals.

The team approach is being stressed not only to analyze product change impact, but to conduct a more thorough investigation into the implementation of such changes. The goal of producing realistic product changes with a minimum of supplementary changes can only be achieved when all the representatives of the major organizations assume their responsibilities and complement the other members of the team.

This section of the standard does not address specific details of the Product Change Process for hardware, software, etc., although revised detailed sections are planned for later release by the Product Change Process Office. Individual groups and sites must ensure that their procedures conform to the Corporate requirements outlined in this standard.

1.3 RESPONSIBILITIES

The organizations identified in the following paragraphs shall ensure that their part in the Change Process is performed accurately, effectively, and efficiently; they shall also see that changes to this standard are requested when necessary or desireable.

1.3.1 Product Change Process Office (PCPO)

The PCPO is the Corporate office responsible for developing all requirements for the Product Change Process within Digital. The policies to be followed will be developed, documented, and managed by this office.

1.3.2 Product Change Team

The Product Change Team is responsible for the control of a given product throughout its lifecycle. The Product Change Team is defined early in the Phase Review process and is headed by the Product Manager (see EL-CP356-00, *Corporate Phase Review Process Guide*). All product changes introduced to that product require the full approval of all Product Change Team members. Product Change Team composition may vary, dependent upon product type as well as type of change being implemented. The following subheads describe general functional responsibilities for each Product Change Team member.

1.3.2.1 Design/Support Engineering

The design/support engineer is responsible for all product-related design and corresponding Technical Data Package changes. General responsibilities include the following:

a. Ensure that all proposed changes to the product(s) are evaluated and transfer specified cost responsibilities to Manufacturing per Phase 4A of the Phase Review Process.

b. Ensure that sufficient information is available for manufacturing and customer services to analyze the change. For example, marked-up or revised draft prints.

c. Ensure that the proposed change corrects the problem or enhances the product.

d. Verify the problem statement and be responsible for the correct solution to the problem.

e. Maintain direct contact with the representatives in manufacturing, customer services, and other end users, to discuss the impact of the proposed changes to their products and organizations. This includes discussions with any vendors that may be affected by the change.

f. Approve all changes as part of a three way sign-off with manufacturing and customer services.

g. Ensure that all Product Safety and regulatory tests have been carried out when necessary and agency approvals gained if required.

h. Ensure that all affected Technical Data Packages are updated according to the contents of the Change Order and signed.

1.3.2.2 Manufacturing

The manufacturing representative is responsible for analyzing the product-related process impacts and update of affected Manufacturing Process Documentation (MPD). General responsibilities include the following:

a. Analyze the proposed change for effects on producibility, test, and capacity, and verify its feasibility in conjunction with design engineering and customer services.

b. Investigate the technical, cost, inventory, and schedule impacts of the proposed change from a manufacturing perspective. This includes discussions with any vendors affected by a change.

c. Ensure that all areas within manufacturing have responded to Design Engineering with the required inputs. This includes any feedback from other central support groups.

d. Approve the change as part of a three-way sign-off with design engineering and customer services.

e. Ensure that all affected support systems, such as MBOMs, test equipment, and the Manufacturing Process Documentation (MPD) are updated for each change.

f. Verify the actual implementation of the approved change, as scheduled by the change.

1.3.2.3 Customer Services

The customer services representative is responsible for identifying all field activities impacted by changes that may affect field service repair centers and depots. General responsibilities include the following:

a. Analyze the proposed change and evaluate for both technical feasibility and potential maintainability impacts with design engineering and manufacturing.

b. Perform a technical and economic impact study of the proposed change on all elements of customer services; provide the results to manufacturing and design engineering.

c. Approve the change as part of a three-way sign-off with design engineering and manufacturing.

d. Determine if a Field Change Order (FCO) is required when an approved product change is identified as affecting customer equipment.

1.3.3 Product Safety/Regulatory Engineering

The Product Safety and Regulatory Engineering representative shall ensure that a product change does not adversely affect equipment certified in accordance with applicable DEC STDs. Any identified impacts shall be reported to the Product Change Team, detailing further required tests and any additional agency approvals to be gained. If and when instructed, the representative shall carry out the required tests and process the agency approvals needed due to the product change activity.

2 GENERAL REQUIREMENTS

A documented product change is required to change all documentation and products. Prior to "Product Release", documents such as Preliminary Change Authorizations (PCAs) will be used as the vehicle for documenting and implementing a change; after "Product Release", documents such as Engineering Change Requests (ECRs) or Engineering Change Orders (ECOs) are required to identify and document the changes. In this context, "Product Release" is defined as product or documentation exiting from Phase 3 (Qualification Phase) and entering into Phase 4 (Production and Support Phase); detailed discussion of these phases may be found in EL-CP356-00.

The product change document is used to notify all affected Digital organizations of changes to a product and, where required, support documentation. The product change document identifies various types of changes such as problems in the design/documentation of the product, potential problems in the product, and cost or performance improvements to the product. For products that have entered phase 4, the product change document will contain the details of the required change and, when necessary, a description of the implementation activities necessary to properly install the change.

The approved product change document is used by organizations as authorization for implementing the change; the document also becomes a permanent historical part of the product's Technical Data Package (TDP).

2.1 ASPECTS OF PRODUCT CHANGE

The product change process is initiated when a potential problem or need has been identified. The product change process is characterized by the following basic activities.

2.1.1 Identification of Need

Either a problem statement or a recommendation for cost or performance improvement is documented and submitted via the product change process for further evaluation. In some cases, this may affect only documentation, and not a product.

2.1.2 Technical Investigation

A comprehensive review of the problem statement or improvement recommendation, as well as the validation of the proposed corrective action, shall be performed by the responsible design/support engineer and other members of the Product Change Team, as required. Through a combined effort, the Product Change Team shall agree on either a clear solution, correction, or rejection for the proposed change.

2.1.3 Impact Analysis

Various analyses must be performed as related to the proposed product change. In manufacturing, analysis will focus on the areas of schedules, test, materials, and process-related impacts; in customer services, the analysis shall focus on the areas of maintainability, spares inventory, and repair capability impacts. Evaluation of the analysis results will aid in determining the implementation strategy to be adopted.

2.1.4 Product/Documentation Update

Changes to both product and product-related documentation must conform to the requirements of this standard. Changes to the product and its supporting documentation (Technical Data Package (TDP), Manufacturing Process Documentation (MPD), and field documentation) are processed almost in parallel. A brief description of these activities follows.

2.1.4.1 Documentation

Change instructions are included as part of the product change document. Changes must be made (and verified) to the applicable elements in the TDP (including those parts that are resident in a database) as well as the process documentation. The TDP change portions of this process are carried out by the Engineering Services Design/Drafting site that supports the product being changed; the process and other technical documentation are updated by the impacted manufacturing and field organization.

2.1.4.2 Product

Physical implementation of the change is authorized by an approved product change document. Actual implementation of the change to the product is based upon process documentation developed from the marked-up TDP package and any revised text contained within the approved product change document.

2.2 PROCESSING METHODS

Product changes are processed in either a manual or semi-automated environment, regardless of the processing method chosen. The requirements of this and other applicable sections of the product change standard will be included in each organization's process.

2.3 EXCEPTION MANAGEMENT OF URGENT PRODUCT CHANGES

This section relates only only hardware product changes at this time; other exception management processes will be added as they are identified.

This standard recognizes that there may be occasional urgent exceptions to the normal processing requirements of the product change process. Exceptions are restricted only to allowing the temporary implementation of product change(s) which will either correct a deficiency adversely affecting the customer's capability to process and retain accurate data or allow immediate implementation of a correction for safety reasons. When either of these exception situations arise, the NCMR/Waiver Form described in 76-65075-00, *Procedure For Processing Non-Conforming Material and In-Process Waiver*, should be used; however, in both of these

cases, normal product change documentation must be prepared and processed in accordance with this standard. Detailed instructions on the use of the NCMR/WAIVER form for these temporary hardware product change exceptions may be found in DEC STD 100-1 and 76-65075-00.

3 WHERE TO GET ASSISTANCE

The PCPO is the office working all Product Change Process issues. Anyone having difficulties understanding any element of the Product Change Process or who needs assistance on a specific problem should contact one of the authors or the individual responsible for this standard.

GLOSSARY

Different interpretations around Product Change Process terminology have been experienced among various Digital organizations for some time; these terminology differences continue to hinder the effective and efficient processing and implementation of product changes. Definitions have been developed for certain key terms where confusion has been most evident; these new definitions should reduce the misinterpretations of the past and serve as the basis for a common understanding throughout the Corporation. If there are additional terms that should be included in subsequent updates to this standard, please notify the author.

Affected Locations: These are the sites that are required to provide impact statements for a proposed change back to the responsible design/support group. It is the responsibility of all manufacturing coordinators to notify the responsible design/support coordinator of their products and to keep their plant on distribution for all changes that may affect their site.

Break-In/Effectivity Date: This is the proposed date that various manufacturing and field service facilities will implement the change; each specific affected location must identify its particular date. Until this actual definition is determined through this standard, each plant will define what the date represents. More detail will be presented in DEC STD 100-1 and other sections as they are created or revised.

Canceled Change: An approved change that is later found to be invalid, uneconomical, or not technically feasible, can be canceled. To cancel any change that has been approved and issued, a complete new Change Order is required; supplement Change Orders cannot be used for this purpose. (Unapproved changes are not canceled but are rejected; see Rejected Change.)

Change Order: When a Change Request is fully approved by the Product Change Team, it becomes a Change Order; in the hardware discipline, the change order is currently referred to as an Engineering Change Order (ECO).

Change Request: This is a proposed change that documents a problem but may or may not contain a suggested solution at its writing. The preliminary change package will be used throughout the review process until approved as a Change Order. (See Change Order.)

Combining Change Requests: Where possible, the Engineering Design/Support Coordinator will recommend combining Change Requests into one to save on processing time and costs against the same product.

Customer Services Representative: The Customer Service Systems Engineering (CSSE) representative is responsible for the assessment of the technical impact of a Change Request from the field's perspective (see subhead 1.3.2.3).

Design/Support Engineering Representative: The design/support engineering representative is responsible for the product's design and its associated Technical Data Package (TDP) and is one-third of the hardware Product Change Team. In the context of product change, this person may be from either a design engineering or support engineering group.

ECO Type Codes (for Hardware): The current ECO Type Codes (for hardware) reflect the urgency and nature of a product change. Type Codes are 1 (Safety), 2 (Not To Specification), 3 (Cost Reduction), 4 (Enhancement), and 5 (Documentation).

Engineering Change Order (ECO) (for Hardware): This is the formal document used to describe a product change and its related impacts for hardware and system products. See also Change Request.

Engineering Change Request (ECR) (for Hardware): This is a document used to request a product change and may be in either hardcopy or electronic form. See also Change Request.

Design/Support Change Coordinator: The Design/Support Change Coordinator is responsible for the following:

a. Receive, track, and distribute all proposed and approved changes to organizations affected by each specific Change Request and Change Order.

b. Maintain the current status of all changes in-process against their products.

c. Serve as the central focus for maintaining control of both the Change Request stage and Change Order stage of the Product Change Process to Final Issue.

Final Issue (for Hardware): When updates to the Technical Data Package are completed by design services personnel, the approved First Issue cover sheet will have the "Final Issue Date" block added and the entire package will be prepared for global distribution.

First Issue (for Hardware): When all members of the Product Change Team have approved an Engineering Change Request, thus signifying full authorization for affected organizations to implement the product change, a First Issue Engineering Change Order is released for global distribution.

Manufacturing Product Change Coordinator: The Manufacturing Product Change Coordinator is responsible for receiving all changes from the Design/Support Coordinator, distributing the documentation to the in-plant review team for their evaluation and impact statements, and forwarding all plant-related impacts to the engineering coordinator.

Manufacturing Representative: The Manufacturing Representative is responsible for assessment of all manufacturing impacts of a Product Change Request to the actual product and related Manufacturing Process Documentation (MPD), and serves as one-third of the Product Change Team.

Originator: The person documenting the change request; can be anyone aware of a product deficiency or a potential improvement to a product.

Preliminary Change Authorization: This is the process for controlling the changes to product documentation prior to release. The PCA process will not be used after the release of the product drawings.

Product: An item (product) that meets any of the following criteria:

a. Has a formal description of attributes or how to build it.

b. May have Manufacturing Process Documentation to describe its build sequence.

c. Is either included in (or with) a higher assembly or sold as an individual entity.

Product Change Team: The responsible representatives from design/support engineering, manufacturing, and customer services make up the Product Change Team for various products within the hardware businesses; other forms of Product Change Teams, such as components, software, or documentation, are not defined in this standard at this time.

Rejected Changes (for Hardware): Unapproved changes that are identified as having a problem will be rejected and returned to the originator by the Design/Support Coordinator.

Product Release: This term describes the state of a product when all the data needed to build the product has been made available and signed over to Manufacturing. This generally occurs late in Phase 3 (Qualification Phase).

Rewrite (for Hardware): This term describes the process of revising an existing Engineering Change Request or Preliminary Change Order prior to its approval for First Issue.

Supplement Change (for Hardware): The supplement cannot alter the present new revision in any manner, through form, fit, or function; it only clarifies information on the present Change Order. Approval for anything that affects ordering parts, inventory, kitting, rework, or production areas (both in manufacturing and the field) can only be made by the Product Change Team. Master drawings can be corrected as long as the revised change has not been approved and distributed. If the product has been changed and the drawings have been approved and distributed, a new Change Order and revision to the documents or part is required.

Technical Data Package: The engineering drawings, databases, and specifications needed to manufacture and test a product.

APPENDIX A

REFERENCED AND RELATED DOCUMENTS

A.1 EL-Class Digital Documents

EL-Class Number	Document Title
EL-00028-00	*DEC STD 028-0 Phase Review Policy*
EL-00100-01	*DEC STD 100-1 Engineering Change Orders - Hardware*
EL-00100-1C	*DEC STD 100-1C Engineering Change Orders - Financing ECOs to Hardware*
EL-00100-02	*DEC STD 100-2 Purchase Specification ECOs*
EL-00100-03	*DEC STD 100-3 Diagnostic Engineering Change Orders (DECOs) and Patch Orders (DEPOs) and Form Preparation*
EL-00115-00	*Manufacturing Plant Documentation (MPD) Identification and Control*
EL-CP356-00	*Corporate Phase Review Process Guide*
EL-EN100-1A	*Engineering ECO Coordination Procedure*
EL-EN100-1B	*Hardware ECO Form Procedure*
EL-EN100-1D	*Preliminary Change Authorization (PCA) Process*
EL-SM100-00	*DEC STD 100 ECO Process and Procedures*
76-65075-00	*Procedure for Processing Non-Conforming Material and In-Process Waiver*

Copies of Digital EL-Class documents may be obtained from Standards and Methods Control, NRO4/D4, DTN: 287-3724, JOKUR::SMC.

Please provide your name, mail stop, cost center, badge number, and node address when ordering.

```
+-------------------------------------------------------------------+
|                        READER COMMENTS                            |
|                                                                   |
| Your  comments  and suggestions  will help  Standards and Methods |
| Control improve their services and documents.                     |
+-------------------------------------------------------------------+
```

Did you request this document? _____ If so, did it arrive within a satisfactory period of time? _____ Please comment.

What are your impressions of this document? Consider format, organization, completeness, readability, and illustrations.

_____ **FOLD ON THIS LINE**_____

Did you find technical or clerical errors in this document? If so, please specify the page number(s) and the error(s).

Are the instructions for the update package clear? _____
Was an index available? _____ If not, is one needed? _____
Do you have other suggestions for improving this document?

The following information is optional:

Name _____ Mailstop _____

Department _____ Node _____

Send your comments to JOKUR::PROJECTS, or fold, staple, and send this page through interoffice mail to:

```
+------------------------------+
|       READERS' COMMENTS      |
| STANDARDS AND METHODS CONTROL |
|           NRO4/D4            |
+------------------------------+
```